Inspection Report for Site Visit of Environmental Geo Technologies (EGT) Conducted on June 26 and 27, 2013.

Report prepared by: Allan Batka

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Present during site visit:
John Frost, EGT Plant Manager
James Hawkins, EGT Laboratory Manager
Donald Anderson, EGT Deep well Operator
Richard Powals, EGT
Tom Athans, Vice President, Helicon Holdings
Richard Schildhouse, Subsurface
Baker and Hughes well test crew
Ray Vugrinovich (June 26), MDEQ
Sean (June 27), MDEQ
Stephen Roy, USEPA
Jeffrey Wawczak, USEPA
Tim Elkins, USEPA
Allan Batka, USEPA

Purpose of inspection:

EPA conducted this inspection as required by Part I, Section L *("Commencement of Injection")* (2) and (4) of EGT permits: MI-163-1W-C010 & C011. Section (L)(2) requires EPA to inspect all well monitoring equipment and verify that it is operational. Section (L)(4) requires EPA to witness the successful test of the automatic warning and shut-off system under simulated failure conditions.

Inspection Activities on June 26, 2013:

Subsurface conducted the annular pressure test on well #'s 1 and 2, and the temperature log (TL) and radioactive tracer survey (RTS) on well #1.

At the conclusion of the annular pressure test on well #1 the pressure on the annulus was released. When the annular pressure dropped below 100 psi an audio and visual alarm sounded, indicating low annular pressure. This alarm is part of EGT's monitoring system for the annular pressure.

During the annular pressure test for well #2, the annular pressure was raised above 950 psi. At 950 psi, an audio and visual alarm sounded indicating high annular pressure. This alarm is part of EGT's monitoring system for the annular pressure. Mr. Anderson explained that the annular alarm is set at 950 psi. If annular pressure was to increase to 1000 psi, the well injection pump would shut-down when the alarm system is operating in the automatic mode. For the purpose of conducting the annular pressure tests the well

monitoring system was set in the manual mode and all well controls were operated directly by Mr. Anderson.

Injection of fresh waster was used for the purpose of conducting the RTS. EGT connected a hose from a fresh water tap and filled the Secondary Storage Tank (SST) located in the treatment building. The SST is the post treatment storage tank which discharges to the pump house for injection into well #'s 1 & 2. The EPA approved procedures for conducting the RTS requires a flow rate of between 20 and 50 gallons per minute (gpm). Flow rate into the wells, for the purpose of the RTS, was controlled by the injection pump speed and an injection flow valve, if needed.

Injection flow rate is monitored by two flow meters, one designated for each well. During the RTS for well #1 it was observed that the flow meter for well #1 was not functioning properly. Mr. Anderson explained that to insure that the flow rate is kept between 20 and 50 gpm during the RTS for well #1, the flow meter for well #2 and a correlation of pump motor speed between wells 1 and 2 would be made. Prior to the RTS for well #1, Mr. Anderson injected fresh water from the SST using the pump for well #1, and the flow meter for well #2 for injection into well #2. Mr. Anderson established the pump #1 motor speed in revolutions per minute (rpm) to maintain a 35 gpm injection rate into well #2. With this correlated pump motor speed and injection rate, Mr. Anderson injected fresh water into well #1 (for the RTS) using the correlated pump motor speed to establish the 35 gpm flow rate into well #1. As a back-up to this method of flow monitoring, Mr. Anderson also monitored the SST tank volume before and after the RTS. Using the change in fresh water volume and the elapsed time for injection into well #1, a confirmation of flow rate was made for the RTS.

During injection into well #1, EPA noted that the volume flow rate (totalizer) was not working. All other monitors (pH, injection pressure, annulus pressure, differential pressure, sight glass level) appeared to be working.

Sometime during the test of well #1 the sump at well #1 filled with water. A monitor in this well sump triggered a high fluid level alarm and shut-down the injection pump. This alarm is part of EGT's monitoring system for the injection well operation.

EPA discussed EGT's method for corrosion monitoring with EGT personnel. Mr. Frost explained that EGT was initially going to use the corrosion monitoring method put in place by EDS. This system used a sample section of injection tubing (spool) placed in the flow line from the SST to well #1. In addition, three coupons were inserted into this same waste flow line to well #1. *(A coupon is a sample of well construction material. To monitor corrosion of this well material, samples (coupons) are place in the waste flow stream and periodically monitored for size and weight. The three materials (coupons) used by EGT are samples of the packer material, steel casing, and fiberglass injection tubing.)* However, this method only monitored corrosion for well #1. EGT is in the process of changing the location of the spool and coupons from the flow line to well #1 to the discharge flow line from the SST. This new location will monitor corrosion for both well #'s 1 & 2, as opposed to just well #1.

EPA reviewed EGT's current Corrosion Monitoring Plan. EPA found that the current plan is not consistent with the new method EGT is proposing to use. EGT and EPA discussed the plan and if changing (updating) the plan to match the new method of monitoring would require a permit modification. EPA identified that a determination would be made at EPA's Region 5 office and EGT would be contacted with the determination. EPA has since determined that a permit modification is not required under Part II, Section C.5.

Inspection Activities on June 27, 2013:

Subsurface conducted the TL and RTS on well #2.

EPA conducted a records review with Mr. Frost and Mr. Powals. The records review covered: calibration records for all monitoring equipment, maintenance records, monthly reports, operator training and continuing education. EPA's review also included site security.

At present there are no records for calibration of well monitoring equipment. EGT explained that the facility would need to be injecting to calibrate the monitors used for deep well injection. Once authorization to inject is granted to EGT, a calibration consultant will be hired to perform on-site calibration of all well monitors.

Since the facility has not been operating, there are presently no operating reports. However, once operating, the reports will be kept in files located in Mr. Frost's office. Monitoring records will include circular charts used for monitoring each well and waste generator information for waste loads treated and injected.

EGT training records are kept in files in Mr. Frost's office. These records include: new and current employee 40 hour hazardous waste operator training, site specific training course work, and weekly (Monday morning) training meetings conducted by Mr. Powals.

EGT's site security system consists of 24 hour recorded video surveillance of the facility, a chain link fence with razor wire surrounding the facility, and 24/7 security service with guard house check in for all plant visitors. Video security monitors are located at two locations inside the facility offices and a third location in the guard house. All access to the facility is through sign-in and issuance of visitors badge system with radio contact between guard house and plant manager.

At about 2:30 pm EGT began injecting into well #2 for the purpose of conducting the RTS. EPA observed operation of the following injection monitors: pH, flow (31 gpm), injection pressure (297 psi), annular pressure (485 psi), differential pressure (187 psi), and sight glass level. It was noted during the injection into well #2 that the volume flow monitor (totalizer) was not working. EGT explained that this was due to a problem with the computer programming for the flow monitors.

The current sampling location is located at the top of the SST tank. This location requires the operator to climb the tank to take a sample. EGT is in the process of installing a sampling tap into the SST tank and locating a dedicated sampling location adjacent to the SST tank. This new sampling location will eliminate climbing the SST to sample treated waste.

EPA observed EGT's attempt to trigger the alarm and automatic shut-down of injection pump under simulated well failure conditions. EGT attempted to simulate a well failure condition (build-up of pressure) on well #1. The permitted maximum injection pressure is 765 psi. The computerized well monitoring system is set to trigger a warning alarm at 700 psi and pump shut-down at 750 psi. EGT attempted to build up injection pressure by increasing the pumping rate, then, shutting a valve to the well to simulate well failure. EGT made several attempts to trigger the alarm and well shut-down, but could not generate enough injection pressure to trigger the alarm (set at 700 psi).

EGT conducted a simulated failure of the annulus for well #1. The computer monitoring system is set to trigger an alarm when the annulus pressure is at 150 psi and shut-down the well pump at 125 psi. EGT simulated the annulus failure by bleeding the annulus pressure during injection into well #1. During the simulation, EPA observed the audio and visual alarm triggered at 155 psi, and the well pump shut-down at 125 psi.

EGT made an additional attempt to simulate the high pressure well failure on well #1 using the same procedure as describer above. EPA observed the audio and visual alarm trigger at 690 psi and the well pump shut-down at 751 psi.

A leak in the head of well #1 was detected. The leak was identified to have occurred sometime prior to the simulated high pressure failure test. Mr. Schildhouse identified the leak at the well head and speculated that the repair could be made by tightening the well head equipment. This would not involve the movement of the packer or release of the annulus pressure. The repair of this leak was confirmed by EPA during a second site visit on August 8, 2013. EGT confirmed (during EPA 8/8/13 site visit) that the repair consisted of tightening the well head equipment which did not release the annulus pressure or move the packer on well #1.

Conclusions:

The requirements of Part I, Section (L) (2) were not completely satisfied. Section (L)(2) requires EPA to inspect all well monitoring equipment and verify that it is operational. During this inspection, EPA observed the following:

- the flow meter for well #1 was not functioning properly
- the volume flow meter (totalizer) was not operational
- EGT is in the process of changing the location of the corrosion monitoring equipment and updating the corrosion monitoring plan to match the new method of monitoring. The updated corrosion monitoring plan must be submitted for EPA approval.

The requirements of Part I, Section (L) (4) were not completely satisfied. Section (L)(4) requires EPA to witness the successful test of the automatic warning and shut-off system under simulated failure conditions. The automatic warning and shut-off system was not tested at this time for simulated failure conditions for well #2 for exceeding the permitted maximum injection pressure, and, falling below the minimum annulus pressure during injection.